THE PRESENT POSITION OF THE SURGERY OF THE HYPERTROPHIED PROSTATE.

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IN 1893, the ANNALS OF SURGERY published a paper with the above title, in which I considered the subject under the following headings:

(1) The nature and chief varieties of the prostatic enlargement and their relation to the vesical changes found associated with them.

(2) The symptoms in relation to diagnosis and prognosis: (*a*) subjective; (*b*) objective.

(3) The indications for (*a*) non-interference; (*b*) medical treatment; (*c*) palliative treatment; (*d*) operative treatment.

(4) The choice of operation.

I shall briefly, and, for economy of space, without attempting to give detailed reasons, state the views under these respective headings which now seem to me to be entitled to at least provisional acceptance by the profession:

1. As to the essential causes of the enlargement, the existing theories may be summarized as follows:

It has been attributed to (*a*) the general arteriosclerosis of old age (Guyon); (*b*) a primary change in the bladder necessitating a compensatory hypertrophy of the prostate (Harrison); (*c*) a growth analogous to uterine fibromyoma (Thompson); (*d*) the persistence in an adjunct sexual organ, of physiological activity intended for the control and determination of the masculine characteristics, after the need for such activity had disappeared (White); (*e*) an attempt to compensate quantitatively for a qualitative deterioration in the prostatic secretion, whose function (Fürbringer) is to determine

the mobility and vitality of the spermatozoa (Rovsing); and, recently, (*f*) infection (most often by the gonococcus), aggravating a senile degenerative process (Geiger, Crandon); (*g*) inflammation extending from the urethra to the prostatic ducts and resulting in dilatation of the glandular alveoli (Herring, Daniel). None of these theories has been demonstrated, and some of them are insusceptible of demonstration, but that of Rovsing seems best to explain the shrinkage of the prostate which in many cases follows castration or vasectomy.

The gonococcus theory is sufficiently well supported to justify further investigation on the same lines, although at present the weight of evidence is distinctly against it. Some very interesting clinical facts may become explicable in the light of this theory if it should—as seems unlikely—receive confirmation. For example, Rovsing has recently reported five cases of double castration. In three, with no previous history of gonorrhœa, the results were extremely favorable. In a man of eighty-five, who had had total retention for eleven years, spontaneous evacuation of the bladder followed within six weeks; the other two, aged sixty-four and seventy-six, were alive and entirely well six years later. The two cases that showed no improvement had had gonorrhœa.

It is obvious that, as regards both prognosis and treatment, it is most desirable that we should discover the cause of prostatic hypertrophy. If the enlargement is merely one symptom of a general or constitutional condition, or if it is secondary to precedent changes in the bladder-walls, it would seem that much less could be expected from treatment than if it is dependent on causes at present unknown, but which may be said to be inherent in the structure or in the functional condition of the gland itself, or to be infective in character. If the changes in the bladder-walls and the accumulation of residual urine are the result of the precedent prostatic disease, treatment of the latter, if early and judicious, offers much more prospect of success. There is at present no reason to doubt that the vesical changes and symptoms are caused by (1) the

mechanical obstruction which the enlarged prostate offers to the ready and complete evacuation of the bladder; (2) the circulatory disturbance incident to pressure on the prostatic veins into which the blood from the vesical veins passes, and (3) septic infection.

2. In prostatic symptomatology nothing new that has any important bearing on diagnosis or prognosis has been added to our knowledge during the last decade.

(*a*) The *subjective symptoms* excited by prostatic hypertrophy may still be summarized as follows: Undue frequency of urination, especially at night; difficulty in starting the stream; feebleness of the stream; interrupted urination; urinary incontinence; retention of urine; changes in the urine; sensory disturbance; constitutional symptoms. They are all due to pressure of the enlarged prostate on surrounding parts, to obstruction of the prostatic urethra, and to inflammatory, atrophic, or degenerative changes resulting from this obstruction.

(*b*) The *objective symptoms* are still elicited by measuring the quantity of residual urine, by digital exploration through the rectum, and by such instrumental examination as will determine the length of the urethra, the seat, nature, and degree of the obstruction, the tonicity of the bladder, and the condition of the ureters, of the renal pelves, and of the kidneys themselves.

While progress has undoubtedly been made of late years in the simplification and improvement of many urethral and vesical instruments (especially of the cystoscope), no fundamental change has occurred, and it is still possible in the majority of cases to reach a sound conclusion as to the above points by a careful study of the history, and of the urine, and by the aid of catheters, vesical searchers, and the finger.

3. In considering the indications for treatment, the *classification* of cases of prostatic hypertrophy is of interest. It is well to determine (*a*) the predominant character of the growth, whether *soft*, indicating excess of glandular and muscular elements; or *hard*, showing advanced fibroid change. The dis-

tinction can be made more simply and accurately by rectal palpation than by any other method; (*b*) the seat of the growth, median, lateral, or general; (*c*) the presence or absence of general arteriosclerosis; and (*d*) the condition of the vesical mucosa and of the upper urinary tract as to pyogenic infection.

The last of these is the most important in its relation to the choice between expectant or palliative and operative treatment, and to prognosis.

4. As to the various possible plans of managing a case of prostatic hypertrophy, it may be said:

(*a*) That a purely expectant treatment is proper only in those cases (usually discovered during a rectal examination made for other purposes) in which the enlargement has produced no symptoms, catheterism is easy, and there is no residual urine.

(*b*) That no medical treatment is worthy of consideration except as, by means of urinary antiseptics, it may tend to prevent or mitigate the occurrence of infection.

(*c*) Palliative treatment still consists, as it did ten years ago, in either the systematic use of steel sounds or other instruments for purposes of dilatation, or in the employment of the catheter, and is still of value in a considerable number of cases. As to this important matter, after ten years' additional experience, and after carefully reviewing the literature, I believe the tendency of the profession should be—as it is—towards earlier operation, and that palliation—dilatation or catheterism—should be carefully restricted, and its effects watched with scrupulous exactness. There can be no doubt that the danger resulting from the pressure of residual urine in moderate quantity, while real, is less than that due to infection. If infection arose only from instrumentation, the use of the catheter might be properly delayed (when more radical measures are declined) until the residual urine was in quantity sufficient to begin to affect the general health by causing great frequency of urination, by backward pressure, or in other ways. As, however, infection occurs in many cases without previous instrumentation, as it is greatly favored by the congestion incident to retention, and as

the atrophic, ureteral, and renal changes from backward pressure are often unrecognizable in their early stages, and practically incurable later, the following rules as to dilatation and catheterism seem still to be applicable to some early and mild cases, and to many others in which, for any reason, operative treatment cannot be employed:

Dilatation.—A patient who presents the symptoms of the prostato-vesical congestion of the early stages of hypertrophy, who is disturbed once or twice at night, who has an enlargement of moderate density, appreciable through the rectum, but not offering much resistance to the introduction of an ordinary catheter, and who has but little residual urine, is likely to derive great benefit from the systematic introduction of full-sized steel sounds. I have always under observation a number of such patients in whom this treatment, and this alone, seems to relieve existing symptoms and to prevent, or at least delay, the development of further trouble. That it can have any true curative effect is unlikely; that it can even modify to any extent the continuous enlargement of the gland seems improbable, but that, either by producing a local atrophy in the parts immediately surrounding the urethra, or by simply stretching the canal itself and relieving local congestion and tumefaction, it mitigates the early symptoms, lessens the vesical irritability, diminishes the amount of residual urine, and modifies favorably the whole course of the case, seems to me beyond all doubt.

Catheterism should be systematically employed in cases in which the quantity of residual urine is three or four ounces or more, and in which the introduction of the instrument is easy and painless, and the urine is sterile. The frequency should be proportionate to the amount and character of the residual urine; a very good working rule (if the urine is sterile) being to use the catheter once daily (preferably at bedtime) for three ounces, twice for six ounces, and then once more for any additional two ounces. With sterile urine it is rarely necessary to use it oftener than once in every four hours.

The objections to habitual catheterism in prostatics are: (1) the risk of vesical infection; (2) the production of vesical

atony. These are very real and very serious, although not sufficient to contraindicate the employment of the method. The first may often, but not always, be avoided by scrupulous and unflagging care as to asepsis. The second is unavoidable, and this fact should be regarded as weighing in favor of operation in all cases where it comes up for consideration.

(*d*) Operative treatment should now be regarded as distinctly indicated whenever a progressive prostatic hypertrophy exists, or when, even in patients with but moderate obstruction, good compensatory hypertrophy of the bladder and a small amount of residual urine, catheterism is becoming more painful or more difficult, the urine shows fermentative changes, and the vesical congestion is passing into a true cystitis. These indications become more definite and more urgent in almost direct proportion to the duration of the prostatic symptoms and to the age of the patient.

As distinct advance in operative methods has been made during this decade, and as we can offer to the average patient both greater hope of full relief and lessened risk, these indications, which are substantially those mentioned in 1893, should, in my opinion, be still further emphasized and insisted upon for the reasons that I then gave, viz., because, on the one hand, it is just at that period of the case when operation is for the first time clearly indicated and justified, and, on the other hand, that it promises most.

5. As to the choice of operation, it does not seem to me necessary to consider such methods as the injection of iodine, ergotin, or carbolic acid; the application of a continuous current through the negative pole inserted into the body of the gland through the rectum, the positive pole being applied to the abdomen; the application of the galvanocautery to the mucous membrane of the prostatic urethra by means of instantaneous flashes; the division of the bar at the neck of the bladder by means of a cutting instrument inserted through the penile urethra; the overstretching of the prostatic urethra; or the ligation of the internal iliacs. They were merely mentioned in 1893. They scarcely require mention now.

The section at the neck of the bladder by means of the electrocautery (Bottini) and its modifications, such as galvano-prostatomy (Chetwood), should in fairness be regarded as still on trial. The number and the professional position of their advocates render impossible the summary dismissal of these methods as unworthy of consideration. While I never mention them to my patients as among the alternatives presented to them, I recognize their theoretical advantages and await their satisfactory clinical demonstration. As I said in 1893: "It may be that some of them contain the germs of what is destined to be the approved and successful treatment of the future. At present, however, the evidence points in the contrary direction."

The remaining methods of treatment that are to be considered are (*a*) those directed to procuring shrinkage of the prostate by operations on the sexual apparatus (castration, vasectomy); and (*b*) the direct removal of the enlarged gland (prostatectomy).

(*a*) Doubtless many surgeons, probably most surgeons, would to-day dismiss castration and vasectomy from consideration as summarily as I have rejected interstitial injection or transrectal galvanism. It may be that they are entirely right. It was in the paper which I have taken as a basis of comparison in preparing this one—an address before the American Surgical Association—that I first suggested castration as a possibility in the treatment of prostatic hypertrophy. Ramm, of Norway, appears to have had the same idea at about the same time, but to have published nothing until later. Doubtless others had thought of it more or less vaguely, but no one seems to have tried to test its value experimentally as I had done previous to laying it before the profession.

As this is an "anniversary" number of the ANNALS, and is with propriety somewhat historical and retrospective in its character, I may be pardoned for quoting two or three sentences that indicate my own mental attitude at that time. I said towards the end of the paper: "I have one further thought which I have decided to mention to this Association, although I do so with a reluctance born of the fear of being considered

illogical or impractical, or perhaps both." I then went on to recall the well-known theory as to the analogy between uterine fibromyomata and prostatic overgrowth, the effect of oophorectomy on the former, the testimony as to the infantile character of the prostate in eunuchs, the observations of John Hunter and Griffiths upon the prostates of the mole, the hedgehog, and the bull, and finally described the results of the experimental castration of dogs (Kirby)—with control experiments—in the following words: "These results, which I believe may be relied upon, place beyond all peradventure the influence of castration (in the dog at least) upon the condition of the prostate, and show clearly that the operation is followed invariably, and with a promptness which I must confess was to me surprising, by atrophy first of the glandular and then of the muscular elements, and by a coincident reduction in both bulk and weight." After discussing the possibility of making these facts a basis for the employment of castration in prostatic hypertrophy, I said: "I do not desire to be understood as insisting upon the truth or even upon the probability of the above hypothesis. I have simply, with much hesitation, determined to follow out publicly a line of thought that had occupied my mind at odd times, and to submit it to your criticism;" and added: "I might admit, finally, that I have not had the courage of my convictions, and have never seriously sought to recommend the operation, but it would be truer to say that I have as yet no definite convictions, and that I am simply seeking enough light upon the subject to convince me either that it is worth pursuing further, or, on the other hand, that it offers no possibility of practical usefulness."

Even with so cautious a presentation of the subject, however, the operation was taken up all over the world with great rapidity, and large numbers of patients were subjected to it, some of them, as the reports show, already moribund. Many cases were operated upon and the immediate results published before I had myself found what I regarded as a case suitable for this procedure.

I had spoken of the operation as one "with a low mor-

tality," and so conservative a surgeon as Lord Lister, in commenting on my paper, remarked that I should have said "with no mortality." I was disappointed to find that a very considerable mortality was reported. It was true that the majority of the deaths were obviously in spite of, not because of, the operation. Still, the death-rate was larger than any one had anticipated. Two years later (July, 1895) I was able to gather from surgical literature and through correspondence, and to report in the ANNALS, a series of 111 cases that had been operated upon. The deaths were twenty, thirteen of which I thought should be excluded in an attempt to arrive at the legitimate mortality, as they had occurred in cases that were obviously at the point of death when operated upon. Still, even with this exclusion—which was not assented to by the critics of the operation—the remaining mortality of 7 per cent. was greater than I had anticipated.

A glance at that paper with its table of cases will show apparently (according to the reports of surgeons from all countries in the world) that in about 85 per cent. of cases such diminution in size of the prostate had rapidly followed the operation that it was thought to be analogous to, or identical with, the atrophy I had experimentally shown to occur in dogs; that long-standing cystitis had disappeared or greatly lessened in more than half the cases; that distinct amelioration of the most troublesome symptoms had occurred in over 80 per cent. and a return to local conditions not very far removed from normal in 46 per cent. of those operated upon.

At this time I felt hopeful as to the future of the operation, and defended it to the best of my ability, on the basis of these clinical reports of actual cases. I was doubtless too easily convinced, as, judged by their reports, were many other surgeons, and perhaps my defence was often—as is not uncommon in controversial literature—somewhat too vigorous; but by the end of 1896 I said (ANNALS OF SURGERY, Vol. xxiv, page 398) that I would be quite content if nothing better could ever be said of the operation than Dr. Arthur Cabot (who had been a keen and thoughtful critic from the beginning) said would

be justified by the then existing statistics if further experience confirmed them, viz., "We shall be able to express the facts thus to our inquiring patients: You have eight chances in ten of getting through the operation all right, and if you are successful in this, you have again eight chances in ten, or a little better, of getting very substantial relief from your urinary difficulties."

In 1900, Dr. Alfred Wood published (ANNALS OF SURGERY, Vol. xxxii, page 309) a collection of 159 cases of castration, and 193 cases of vasectomy, none of which had been included in my table of 1895, or in Cabot's table of 1896. The reported results of the castrations showed thirteen deaths (a little over 8 per cent. of mortality), and with some variations corresponded approximately to the results shown in the earliest table. In the vasectomies the mortality was 6.7 per cent., and in 67 per cent. some form of general improvement was noted.

In the same year (1900) Mr. Reginald Harrison reported more than 100 cases of vasectomy, and said that he had been able to observe "benefit of some kind and in some degree in almost every case, although the accompanying conditions often prevented anything like a cure."

In 1902, Rovsing reported forty cases of vasectomy, of which twenty-seven were cured, nine relieved, and four unimproved. There were no deaths. He adds: "I should under no circumstances feel myself justified in undertaking the total extirpation of the prostate in a patient in whom I had not done a vasectomy, which in many cases gives such extraordinary relief."

Since then no notable papers on this subject have been published. I may be pardoned for adding that during the decade during which this evidence has been accumulating I have in my own practice—including both private and hospital patients—found but fifteen cases in which I thought castration justifiable, and thirty-seven cases in which I have performed vasectomy. I mention these figures merely to indicate that I have tried to preserve the conservatism with which I suggested the operation originally.

My present opinion is that castration and vasectomy are

likely to occupy a more and more restricted field in the treatment of prostatic hypertrophy. In properly selected cases I still think that they are likely to have a low mortality, and that when fully successful they secure a return to a condition more closely resembling the normal than most of the other operations looking towards a radical cure of the hypertrophied prostate. They certainly cannot, however, be said to be gaining ground in the favor of the profession. Although in the several hundreds of reported cases the outcome seemed in the majority of instances to be satisfactory to the operators, these procedures have been gradually given up in favor of various others more recently advocated. The uncertainty of their results, both immediate and remote; the fact that they are not free from danger; and, so far as castration is concerned, the strong and not unreasonable sentimental objections to it, combine to render their final status in the treatment of prostatic hypertrophy a matter of doubt. It may be that a better classification of prostatics in accordance with their clinical history will resolve this doubt.

In the meanwhile, without the least disposition to urge these operations upon the profession, or to claim anything for them which facts do not justify, I would suggest that they still merit at least occasional consideration; that not *all* of the published reports of successes can be inaccurate or misleading; that such testimony as Harrison's or Rovsing's should not lightly be ignored; and that it is quite possible that there may still be a definite field of usefulness for these procedures, although I now believe that it will be much more limited than I at one time thought it would be.

(*b*) My opinion as to the greatly—and justly—increased limitations of these operations in the future is much influenced by the improvement, to which I have already alluded, in the method of performing prostatectomy.

Largely through the work of one surgeon, Mr. P. J. Freyer, suprapubic enucleation of the entire gland has during the last decade become the operation of choice in the majority of cases. He opens the bladder in the usual way, having intro-

duced and left *in situ* a hard-gum catheter. He scratches or scrapes through the mucous membrane over the prominent portions of the prostate, which, he says, will usually be found by pressure to have so thinned the fibrous sheath formed from the pelvic fascia that the finger comes down on the true capsule of the prostate. This is deficient along the upper and lower commissures or bridges of tissue that unite the lateral lobes above and below the urethra. These lobes are separate in early fœtal life, and tend to revert to this condition and become more distinct when hypertrophied. Accordingly, it is possible, by following the capsule closely with the finger, to enucleate the whole prostate, usually leaving the urethra intact, and sometimes even the ejaculatory ducts. The prostatic plexuses, which lie between the fibrous sheath and the true capsule, are left behind, and the hæmorrhage is therefore trifling. During the procedure the prostate is steadied from beneath, through the rectum, by the fingers of the operator.

The greater simplicity, lessened risk, and more satisfactory results claimed by Mr. Freyer for this operation, as compared with previous methods of prostatectomy, have been demonstrated by his own published experience, and by those of the many surgeons who are now beginning to record their testimony. Up to July of this year, Mr. Freyer had done "total enucleation" in 110 cases, the patients varying in age from fifty-three to eighty-four years, the average age being a little over sixty-eight years, and the prostates weighing from three-quarters of an ounce to fourteen and a quarter ounces, with an average weight of three and a quarter ounces. The majority of the patients had been entirely dependent on the catheter for varying periods extending up to twenty-four years. Nearly all of them were in broken health, and many were apparently moribund when the operation was undertaken. The great majority of them were said to be "reduced to such a wretched condition that existence was simply unendurable." Few of them were free from one or more grave complications, such as cystitis, stone in the bladder, pyelitis, kidney disease, diabetes, heart disease, thoracic aneurism, chronic bronchitis, paralysis, hernia,

hæmorrhoids, etc. This is, of course, a summary of the unpromising conditions recognized by every surgeon as those under which the operation must usually be undertaken.

In three of the cases the disease was malignant. One of these died, the other two recovered. Excluding these three, there were left 107 cases of complete removal of the prostate for adenomatous enlargement, ninety-seven of which were "successful." Mr. Freyer defines "success," as he uses the term, as meaning that the patient regains the power of retaining and passing the urine naturally, without the aid of a catheter, as well as he ever did. He adds: "In no instance has the patient failed to regain the power of voluntary micturition without the aid of a catheter. There has been no instance of relapse of the symptoms; on the contrary, lapse of time only seems to consolidate the cure. In no case has there been contraction at the seat of operation leading to stricture; nor has there been any instance of a permanent fistula remaining."

Of the ten deaths, he thinks that four, or at most five, can be attributed to the operation itself, and that the remainder were due to diseases incident to old age. This seems to me, as I have always contended, a fair way of estimating the risk of a new procedure, or a procedure that is new as applied to a given condition. It would give in his series of cases a mortality of less than 6 per cent. But, accepting all the deaths as having relation to the operation, the mortality is only about 9 per cent., which, considering the precedent condition of the patients, is extraordinarily small. Mr. Freyer says that if the operation were undertaken in selected cases only—cases in which the general health was unimpaired—the mortality might be still further reduced; but I agree with him that any such restriction would be unjustifiable, as it would have the effect of excluding the great majority of the patients who at present seek relief from this operation. I agree, too, with Mr. Freyer that, as the operation becomes more widely known and more popular, patients will no doubt seek relief at an earlier period of the disease, whilst their constitutions are sound and with a much greater prospect of success; and that increased experience in

operating, improvement in the details of the after-treatment, and better nursing, are all factors that will tend to reduce the death-rate.

My own personal experience with the operation tends to confirm all of Mr. Freyer's claims.

The anatomical discussion as to the possibility of "total enucleation," as to the presence of a "true" capsule, as to the retention of the uninjured prostatic urethra, etc., has been and is interesting, but the clinical results of the operation make such discussion seem of academic rather than practical importance.

As to the other methods of prostatectomy,—the perineal, the "combined," etc.,—there can be no doubt that they have often given good results in the hands of some surgeons, and are still the methods preferred by a number of able workers in this field. There are probably cases for which they will always be found specially suitable, but at present it appears to me that such cases will be exceptional, and that past experience does not justify the expectation that the results of prostatectomy by the perineal route will compare favorably with those of the "total enucleation" above described.